

The Concept of Indexation in the History of Economic Thought

Periods of severe monetary disturbance tend to spawn unorthodox and often ingenious stabilization schemes. During such episodes, conventional policies often appear inadequate and the situation seems to call for extraordinary remedies. Thus, for example, the Great Depression of the 1930's inspired a host of novel schemes—including stamped money, taxation of idle hoards, 100 percent reserve requirements behind demand deposits, security reserve proposals, commodity reserve currency, “social credit” remedies, and the like—all designed to promote the recovery that monetary policy was thought incapable of accomplishing by itself. Currently the major economic problem is inflation, virulent double-digit inflation seemingly unstoppable by orthodox measures alone. Predictably, several inflation-combating expedients have been suggested. These include such prescriptions as: the reinstitution of wage and price controls, the levying of profit surtaxes on corporations granting “excessive” or “inflationary” wage increases, and the institution of so-called “social contract” arrangements whereby labor would agree to restrain its wage demands in return for a reduction in its tax burden.

Perhaps the most controversial proposal for fighting inflation, however, is *indexation*, i.e., the idea of inflation-proofing the economy by tying monetary contracts to a general price index. Under comprehensive or widespread indexation, most nominal values would be adjusted automatically to compensate for inflation. Currently, indexation is being touted in some quarters as the best means of helping monetary and fiscal policy bring inflation under control. Led by Milton Friedman, proponents of indexation propose that escalator clauses be applied voluntarily in the private sector to all contractual debts and to most incomes, whether labor (wage and salaries) or investment (interest and dividend) incomes. Moreover, Friedman urges that mandatory indexation be applied to the borrowing and taxing arrangements of the federal government. Specifically, Friedman would require that all government securities contain purchasing-power guarantees and that the personal and corporation income tax systems include compulsory and automatic inflationary ad-

justment of tax brackets, personal exemptions, asset depreciation schedules, and capital gains.

Such comprehensive indexing, Friedman claims, would have at least two therapeutic effects. First, he says, “it would reduce the revenue the government acquires from inflation” thus weakening the government’s “incentive to inflate.” Second, and more important, indexation, in his words, “would reduce the adverse side effects that effective measures to end inflation would have on output and employment.” [8; 94] Constituting the most serious obstacle to the ending of inflation, these harmful side effects stem from institutional and expectational rigidities built into the structure of commodity and factor prices. By preventing some prices from adjusting as fast as others to policy-induced declines in the rate of total spending, these rigidities act to distort or alter *relative* prices (i.e., market exchange ratios or relationships among individual commodity and factor prices), thus influencing quantities of real variables. For example, such influences as long-term labor and debt contracts, lags in the adjustment of price expectations, and money illusion may cause nominal wage and interest rates to lag behind changes in product prices. The failure of these money costs to adjust fully and instantaneously to price level changes would result in an alteration of *real* wage and interest rates, thereby affecting employers’ demands for labor and capital. Indexation, Friedman argues, would eliminate these inflexibilities, thus rendering relative prices (e.g., real wage and interest rates) and the corresponding real economic variables (output, employment, and the rate of capital accumulation) immune from policy-engineered changes in the rate of inflation. In short, with indexing, the economy could move swiftly to a lower inflationary equilibrium without having to endure a prolonged transitional period of low economic growth and high unemployment.

It should be emphasized that Friedman does not claim that indexation by *itself* would lower the rate of inflation. Instead, he argues that indexation would augment the effectiveness of existing anti-inflationary monetary and fiscal policies. That is, by alleviating

the unemployment cost of fighting inflation, indexation would increase the willingness of the authorities to employ conventional demand-management policies.

Friedman's controversial proposal has been widely hailed as both novel and radical. As Friedman himself acknowledges, however, the truth is that proposals to link money payments to a cost-of-living index are neither radical nor new. Such proposals have a long history, dating back at least to the mid-18th century. Thus, for example, the idea of indexation received official endorsement and was embodied in Massachusetts legislation in the 1740's. And as early as the 1780's, indexation was actually employed as a policy experiment when the Massachusetts government attempted to link soldiers' wages to an average of the prices of four staple commodities. Moreover, the concept appears prominently in the writings of 19th and 20th century classical and neo-classical economists who analyzed it under the heading of the so-called "tabular standard of value," referring to the table or list of specific commodities whose prices were to enter the cost-of-living index serving as the standard of deferred payments. Even the more unusual features of Friedman's proposal—e.g., his plan to index taxes and the government debt and his vision of a comprehensively-indexed as distinct from a partially-indexed economy—were fully anticipated in earlier writings, as were his arguments (1) that indexation insulates employment and production from the harmful effects of unanticipated changes in the price level or its rate of increase, and (2) that indexation prevents the government from diverting via taxation an increasing share of resources from the private sector. In short, neither the idea of indexation nor the arguments offered in support of it are new.

The purpose of this article is to document this latter assertion. Accordingly, following a brief description of some early experiments with index-linking arrangements, the article will examine the writings of pertinent classical and neo-classical economists to see what they had to say about the subject. Finally, a concluding section compares Friedman's propositions regarding indexation with those of his classical, neo-classical, and modern predecessors in order to demonstrate their essential similarity.

INDEXATION IN THE EIGHTEENTH CENTURY

Means have long been sought for protecting the real value of time contracts from fluctuations in the value of money. One solution is to tie contractual payments to the particular price of a specific com-

modity, such as wheat or gold, whose value presumably varies less than that of money. This solution is tantamount to guaranteeing payment in terms of a fixed amount of the commodity. For while the price-linked money payments may vary, they would always be just sufficient to purchase a constant quantity of the specified commodity.

The practice of linking contractual payments to a specific price has a long tradition extending back at least to Elizabethan times. Thus, William Stanley Jevons remarks that during the reign of Elizabeth I, the colleges of Oxford, Cambridge, and Eton were required by law to lease out their lands for corn rents, i.e., variable money rents linked to the price of corn. [9; 326] Irving Fisher notes that corn rents were fairly well established in Scotland by the end of the 17th century. [3; 334] And Alfred Marshall refers to the linking of church tithes to the price of grain. [12; 197] Moreover, during the post-World War I hyperinflation in Germany in the early 1920's, contracts of all types were tied to the price of rye. As another example, bonds containing so-called gold clauses linking principal and interest to the price of gold were in common use during the 19th and early 20th centuries. In short, the use of purchasing-power guarantees stipulated in terms of a single specific commodity is a fairly old practice.

The linking of debt payments to one particular price, however, does not constitute true indexation, the essence of which is the use of a price index, or weighted average of many prices, as the standard of deferred payments. The genesis of the indexation concept can be traced to Bishop William Fleetwood's pioneering study, *Chronicon Preciosum: or, an Account of English Money* (1707). In that work Fleetwood made at least two original contributions. He was the first to make systematic use of several prices to measure changes in the value of money. Observing that the particular prices of corn, meat, drink, and cloth had all shown a roughly six-fold increase during the preceding two-and-a-half centuries, he concluded that the value of money had depreciated in the ratio of six to one. Here is the origin of the concept of a cost-of-living index as a measure of changes in the purchasing power of money. Second, Fleetwood suggested that the index number could be used to determine the amount of nominal income corresponding to any given fixed real income. This suggestion emerged from his attempt to establish the maximum money income a person could receive and still be eligible for a certain fellowship. The fellowship was limited to those with real incomes not exceeding the purchasing power of £5 in 1450, the year the scholarship was

founded. Hence, Fleetwood's problem was simply that of finding the current nominal income whose price-deflated or real value was equivalent to a given constant-dollar base or reference period sum of £5. His solution marks, perhaps, the genesis of the idea of linking money incomes to a price index in order to stabilize their real value.

The concept of indexation received its first official endorsement in 1747 when the legislature of colonial Massachusetts legalized the linking of debts to a broadly based measure of the cost of living, while simultaneously prohibiting the tying of debts solely to the particular prices of specific commodities. The question of the validity of individual or particular prices vs. general prices as the basis for deferred payments arose in the following way. After the passage in 1742 of a law permitting the practice, many debts payable in Massachusetts currency had been linked to the prices of silver and London bills of exchange. By 1747, however, it was apparent that this arrangement had been unduly burdensome for debtors. During this period, the prices of silver and foreign exchange had risen much more than had the general price level. Consequently, debtors were forced to repay larger sums to creditors than they would have if debts had been linked to a general price index. As the legislature put it, Massachusetts currency, "to the great grievance of debtors," was "much depreciated with respect to bills of exchange and silver," although it had maintained its purchasing power "with respect to all other commodities and merchandises in this province." [5; 426]

On the basis of this experience, the Massachusetts legislature concluded that the real value of debts could not "be truly estimated by the prices of one or two particular commodities or merchandises, such as bills of exchange or silver . . ." since these specific prices were not representative of the average of all commodity prices. To remedy this defect, the legislature passed an amendment stating that thereafter in applying monetary correction to debts, "regard shall be had not only to silver and bills of exchange, but to the prices of provisions and other necessities of life." [5; 426] Here is the first legal recognition of the principle that indexation should involve the use of purchasing-power guarantees stated in terms of general prices rather than particular prices.

The first practical application of indexation—as opposed to the mere legal recognition of the concept—came during the American Revolution when the Massachusetts legislature decided to link soldiers'

wages to a crude index comprised of an average of the prices of four staple commodities—namely, "Beef, Indian Corn, Sheeps Wool and sole Leather." [5; 435-6] This index, the so-called "Table of Depreciation," was used to determine the additional wages owing to the soldiers in order to compensate them fully for the inflation-induced erosion of the purchasing power of their stipulated enlistment wages. This was, perhaps, the first attempt to link wages to a cost-of-living index.

This episode also produced the first experiment with an index-linked government bond, i.e., a state-issued financial obligation carrying a purchasing-power guarantee. These bonds were issued as part of the wage-adjustment scheme. More specifically, the additional wage compensation was to be paid to the soldiers, not in cash, but in the form of one-to-eight-year interest-bearing bonds known as "soldier depreciation notes." [5; 436-7] Both principal and interest on these notes were tied to the cost-of-living index, thereby guaranteeing yields as well as redemption value in terms of real purchasing power. The total volume of these notes issued is not known, although it has been estimated that between one and two million gold dollars' worth were outstanding in 1781. [5; 442] Evidently the practice of applying a monetary correction to wages and salaries and then paying it off in the form of a purchasing-power bond proved to be an attractive expedient, for it was extended to the incomes of some civilians, including the President of Harvard College, who received almost £500 in such notes in 1780. [5; 448-9]

These experiments indicate that the concept of indexation was fairly well established by the 1780's. It must be admitted, however, that indexation was not viewed by its 18th century proponents as an economic stabilizer. In fact, the sole rationale given for the practice was that of offsetting the inequity arising from inflation. Not until the early 19th century was it claimed that indexation might have some therapeutic effects on output, employment, and the level of economic activity.

CLASSICAL PROPONENTS OF INDEXATION

Joseph Lowe and G. Poulett Scrope, two minor economists of the 19th century British classical school, were the first to argue that, in addition to correcting inequity arising from inflation and deflation, indexation might also have a stabilizing impact on real economic variables. Thus, Lowe, in a section of his book *The Present State of England* (1822) devoted to a "Plan for lessening the Injury arising from the Fluctuations of Prices," said that index-

linking of wage contracts would make employers more willing to grant wage increases in times of inflation, thereby forestalling wage disputes, strikes, and work stoppages that might interrupt production. He also contended that indexation of wage contracts would make workers more willing to accept money wage cuts in times of falling prices. Lowe claimed that, ordinarily, workers would resist cuts in money wages because they feared that wages, once lowered, would not be raised again in periods of inflation. Thus, by trying to protect against possible future declines in *real* wages, workers would maintain money wages at unwarranted high levels in periods of deflation. Indexation, however, by insuring the constancy of real wages over alternating periods of deflation and inflation, would induce workers to accept money wage cuts when prices fell. [11; 335-8] One important implication of Lowe's analysis, although not explicitly mentioned by him, is that indexation, by increasing the downward flexibility of money wages, would help maintain full employment during episodes of falling prices.

Lowe also argued that the use of purchasing-power guarantees would eliminate an important element of risk from business decision-making—namely, the risk of unforeseen changes in the value of money. The elimination of this risk, he thought, would have a beneficial impact on both economic growth and allocative efficiency. For example, he said that indexation of land-rent agreements would encourage landlords and tenants to enter into long-term leases conducive to improvements in agricultural productivity. [11; 338-9] Similarly, he believed that the insertion of purchasing-power clauses in stocks and bonds would decrease the risk and improve the marketability of these securities, thereby promoting the development of the capital market. [11; 341-4] In general, Lowe argued that indexation would diminish the risk of uncertainty associated with fluctuations in the value of money, thereby increasing productivity and growth. In his own words, “the removal of uncertainty from time contracts would contribute very effectively to the extension of our national industry.” [11; 345]

G. Poulett Scrope was the first economist to use the phrase “tabular standard of value” to designate indexation. This phrase appears first in his 1833 pamphlet, *An Examination of the Bank Charter Question* and again in his *Principles of Political Economy* (1833). The tabular standard, of course, referred to the table or list of commodity prices whose weighted average formed the index number used in index-linked contracts. Scrope distinguished

between the medium of exchange, unit of account, and store of value functions of money, maintaining that the latter two functions might advantageously be divorced from money and assigned to the tabular standard. He argued that the tabular standard, as the least variable of all possible standards of value, would perform these functions more reliably than money, whose value was variable and unpredictable. Following Lowe, Scrope claimed that adoption of the tabular standard would have at least two salutary impacts on economic activity. First, it would promote industry by reducing a burdensome form of business risk, i.e., the risk of unexpected changes in the future level of prices. For as he put it, “It is for the interest of industry and commerce that the risk of an unforeseen change in the value of the standard should not be superadded to the other elements of uncertainty to which all industrious and commercial speculations are . . . exposed.” [13; 413-4] Second, and more important, the tabular standard would protect business profit and wealth from deflation-induced rises in the real burden of debt and other fixed costs. Specifically, Scrope argued that unless taxes, rents, debts, and other fixed charges against operating revenue were indexed, a falling price level would erode business profit and redistribute real wealth from productive debtor-entrepreneurs to unproductive creditor-rentiers, thus tending to discourage production and economic expansion. [13; 408-13] Without indexation, said Scrope, a deflation-induced transfer of profit and wealth “must both check the desire to improve, and diminish the means of improvement.” Elsewhere he says that unless profits are protected by the adoption of the tabular standard, “the main inducement to industry is destroyed.” [13; 410]

Two further observations should be made regarding the classical proponents of indexation. First, they did not claim that indexation by itself would stabilize the price level. Lowe, in fact, denied that fluctuations in the price level could be prevented by any means. Scrope, on the other hand, thought that price stability could be attained, but only via proper management of the money supply. And, although he hinted that the price index might serve as a guide or indicator for the monetary authority to use in regulating the money stock, he emphasized that it was the control of the money supply itself that was the essential prerequisite for price stability. [13; 418-9] For the most part, these writers regarded indexation not as an instrument for stabilizing the price level, but rather as a means of insulating the economic system and the level of economic activity

from the destabilizing effects of unforeseen changes in the value of money.

The second comment concerns the other contributions of the classical writers to the theory and practice of indexation. These contributions should not be overlooked. First was the analysis—albeit rudimentary—of technical problems of constructing the appropriate index to use in index-linked contracts. Classical analysts discussed such matters as: sources of data, the selection of representative commodities and weights, and the number of prices to enter in the index. Scrope, for example, thought the index should contain “the prices of one hundred articles in general request; [weighted by] quantities determined by the proportionate consumption of each article.” [13; 406. See also 11; 333-6 and Appendix p. 94-7]

The second and perhaps more important contribution was the proposal for more widespread indexation. Thus Lowe described the benefits that would follow from the indexation of rents, salaries, wages, leases, annuities, securities, and other time contracts, including the public debt. In a similar fashion Scrope wrote that the tabular standard could be used to regulate all “pecuniary engagements.” It should be pointed out, however, that while recommending more widespread use of indexation, these authors advocated that the application of purchasing-power clauses be strictly optional and voluntary, rather than compulsory or mandatory. Scrope, for example, said that contracting parties should have complete freedom to accept or reject the tabular standard, using it only “if they chose” or “if they shall think fit.” Those who wisely wished to hedge or insure against the hazards of unanticipated fluctuations in the value of money or, in his own words, “to run no risks of its variation either way,” could use indexation “to confer on the sum specified a uniformity and permanency of value, by changing its numerical amount in proportion to the change in its power of purchase.” On the other hand, those who opted for unindexed contracts stated in terms of fixed amounts of the nominal monetary unit “would do so with their eyes open to its possible fluctuations.” Voluntary choice of the unindexed monetary unit as the standard of deferred payments would imply “acquiescence in the chances attendant on its use.” [13; 407-8] In short, Lowe and Scrope favored the extension of indexation, but only if it was consistent with the *laissez-faire* principles of 19th century classical liberalism. Nevertheless, the vision of permanent and pervasive voluntary use of the tabular standard represents a significant step from

the 18th century view of indexation as a government-imposed temporary emergency measure applicable, as in the case of the “soldier depreciation notes,” to a limited range of payments.

NEO-CLASSICAL VIEWS OF INDEXATION

The subject of indexation is a prominent theme in the monetary literature, both theoretical and policy-oriented, of the neo-classical period, which runs roughly from 1870 to 1930. Some of the leading neo-classical economists, including William Stanley Jevons, Alfred Marshall, Irving Fisher, Francis Y. Edgeworth, and Francis Amasa Walker, expounded on the subject of indexation and, in many cases, enthusiastically endorsed it as a remedy for monetary instability.

The neo-classical proponents of indexation obviously derived many of their ideas from their classical forebears. For one thing, they shared the latter's vision of a widely indexed economy. Then too, their discussion of indexation proceeded along the lines opened up by their classical predecessors. In fact, the chief neo-classical contribution to the theory and practice of indexation consisted of the clarification, refinement, restatement, coordination, and elaboration of the ideas of earlier proponents of the tabular standard. Specifically, much of the neo-classical analysis of indexation was devoted to considering (1) the impact of indexation on output and employment and (2) technical problems concerning the compilation of a suitable price index number—the two main topics occupying the attention of Lowe and Scrope.

But although the various neo-classical writers were in broad agreement on the main issues concerning indexation and its effects on the economic system, their analyses and policy prescriptions frequently differed in specific details. These differences are significant enough to warrant separate examination of their views, particularly the views of Jevons, Marshall, and Fisher, the leading neo-classical expositors of the indexation concept.

William Stanley Jevons The earliest neo-classical economist to revive the topic of indexation was Jevons, who devoted the entire Chapter 25 of his *Money and the Mechanism of Exchange* (1876) to the discussion of “A Tabular Standard of Value.” After acknowledging his indebtedness to Lowe and Scrope for providing the inspiration for the chapter, Jevons proceeded to advocate that a government agency similar to the Bureau of Labor Statistics be created to compile the index number to be used in correcting money contracts.

To carry Lowe's and Scrope's plans into effect, a permanent government commission would have to be created The officers of the department would collect the current prices of commodities in all the principal markets of the kingdom, and, by a well-defined system of calculations, would compute from these data the average variations in the purchasing power of gold. The decisions of this commission would be published monthly, and payments would be adjusted in accordance with them. Thus, suppose that a debt of one hundred pounds was incurred upon the first of July, 1875, and was to be paid back on the first of July, 1878; if the commission had decided in June, 1878, that the value of gold had fallen in the ratio of 106 to 100 in the intervening years, then the creditor would claim an increase of 6 percent in the nominal amount of the debt. [9; 330-1]

As to the question of whether indexation should be optional or mandatory, Jevons argued that after a trial period in which "the practicability and utility of the plan had become sufficiently demonstrated," it should "be made compulsory." On this point he differed from his classical predecessors, who advocated voluntary indexation. But he agreed with them in favoring widespread if not completely comprehensive indexation. Thus, he proposed that the tabular standard be applied to "every money debt of, say, more than three months' standing." This criterion would cover most short-term as well as all long-term debts. [9; 331]

Jevons attempted to anticipate and assess the importance of some of the practical problems that might arise in the implementation of the indexing scheme. Generally, however, he thought that such difficulties would be minor. For example, he recognized that the government might be tempted to tamper with the index to achieve certain policy goals or to favor specific political factions and socio-economic groups. But he thought that full disclosure of data would prevent such tampering. As he put it, government officials "would be required to publish periodically the detailed tables of prices upon which their calculations were founded, and thus many persons could sufficiently verify the data and the calculations. Fraud would be out of the question." [9; 332]

The only real implementation problem he foresaw was that of selecting the most suitable index number. With regard to the question of the most appropriate index to use, Jevons discussed several technical problems of index number construction, including the number of individual commodity prices to enter in the index, the criteria used in choosing the prices, and the best method of averaging the prices. He expressed a definite preference for an index number composed of the geometric mean of 100 commodity price ratios "chosen with special regard to the independence of their fluctuations one from another."

[9; 332] Although he indicated that this particular index number was his first choice, he concluded that the use of any one of several formulas (e.g., those embodying arithmetic rather than geometric averages of commodity prices) would provide a far more stable standard of deferred payments than that provided by money.

The extent of Jevon's enthusiastic endorsement of indexation is most clearly evident in the following passage enumerating "the advantages which would arise from the establishment of a national tabular standard of value." Indexation, he writes,

would add a wholly new degree of stability to social relations, securing the fixed incomes of individuals and public institutions from the depreciation which they have often suffered. Speculation, too, based upon the frequent oscillations of prices, which take place in the present state of commerce, would be to a certain extent discouraged. The calculations of merchants would be less frequently frustrated by causes beyond their own control, and many bankruptcies would be prevented. Periodical collapses of credit would no doubt recur from time to time, but the intensity of the crises would be mitigated, because as prices fell the liabilities of debtors would decrease approximately in the same ratio. [9; 333]

It is apparent from the above passage that Jevons thought of index-linking not only as a means of ameliorating the injustice, social discontent, and political unrest wrought by inflation and deflation, but also as an economic stabilizer that would reduce the severity of business fluctuations stemming from price-level changes. He clearly states that indexation would prevent falling prices from increasing the real burden of business debt, thus reducing the danger of bankruptcies and collapses that might intensify cyclical contractions. It is also obvious that Jevons felt that with contracts stated in real terms, both uncertainty and speculation would be reduced. Consequently, fewer of the economy's scarce resources would be diverted from production to purely risk-bearing and gambling activity. Businessmen would no longer have to gamble on future price level developments in making their investment decisions. Real rates of return on alternative investment projects could be gauged more accurately. Fewer resources would be channeled into speculative investment in such things as land or inventories of commodities to the detriment of investment in productive capital. The result would be a more efficient pattern of investment and resource allocation. In sum, indexation would permit a higher and more stable level of real output.

Alfred Marshall Like Jevons, Marshall was also an enthusiastic advocate of the tabular standard, a topic that he discussed with great force and con-

viction on many occasions. His own proposal for the adoption of indexation is developed most fully, however, in his celebrated essay "Remedies for Fluctuations of General Prices" which appeared in the March 1887 issue of *Contemporary Review*. In this article Marshall starts out by distinguishing between the medium of exchange function of money and its function as a standard of deferred payments. Arguing that fluctuations in the price level tend to render money defective as a standard of deferred payments, he suggested that this latter function be divorced from money and assigned to the tabular standard. His scheme would, as he put it, relieve "the currency of the duty, which it is not fitted to perform, of acting as a standard of value" and transfer this task to "an authoritative standard of purchasing power independent of the currency." [12; 188] This arrangement, said Marshall, would mean that contracts with a time dimension would be stated not in terms of a fixed amount of money, but rather in terms of a standard unit of purchasing power based on an index number of commodity prices. This unit of purchasing power, which he suggested "might be called for shortness simply THE UNIT," would be chosen to equal the purchasing power of a unit of money as of some designated base date. As Marshall explained it, a government department "having ascertained the prices of all important commodities, would publish from time to time the amount of money required to give the same general purchasing power as, say, £1 had at the beginning of 1887." This information could then be used to determine the magnitude of the money payments necessary to discharge or settle contracts stated in terms of the constant purchasing-power unit. In short, the "Unit" would serve as the standard of deferred payments leaving money free to function solely as a medium of exchange. Each instrument would be assigned the function that it could perform most efficiently. Or, as Marshall put it, "if we have one thing as a medium of exchange, and another as a standard of value, each may be able to perform its share of the work thoroughly well, because it is specially fitted for it." [12; 197]

Unlike Jevons, Marshall insisted that indexation be strictly voluntary, i.e., "at the option of those concerned." But he obviously hoped it would gain widespread usage, for he advocated its application "without delay" to loans, salaries and wages, ground rents, and even to wills and marriage contracts; and he urged the courts to "give every facility to contracts, wills and other documents made in terms of the unit." Moreover, he suggested that the government set an example for the private sector by index-

ing its own affairs whenever possible. Specifically, he proposed that the government: (1) index the wages, salaries, and pensions of its employees; (2) apply a monetary correction to the tax system, which would mean, as he put it, "assessing rates and taxes . . . in terms of the unit"; and (3) issue an index-linked bond, with yield and principal guaranteed in terms of the standard unit of purchasing power. [12; 198-9] These proposals have a distinctly modern ring, especially the plan to index the tax system. These same suggestions are frequently offered as partial solutions to the current problem of inflation.

In describing the benefits that might be expected to result from his plan, Marshall stressed its stabilizing effects on production and employment. An indexed economy, he claimed, would be a vast improvement over the existing non-indexed economy in which "fluctuations in the value of what we use as our standard are ever either flurrying up business activity into unwholesome fever, or else closing factories and workshops by the thousands." [12; 192]

In the particular section of his 1887 paper devoted to an analysis of "the evils of a fluctuating standard of value," Marshall enumerated several reasons why movements in the price level might have adverse impacts on output and employment in an unindexed economy. First, fluctuations in the value of money increase business risks, thus making entrepreneurial decision-making more onerous and burdensome. According to Marshall, not only does the entrepreneur "run the risk that the things which he handles will fall in value relatively to others," but "in addition, he runs the risk that the standard in which he has to pay back what he has borrowed will be a different one from that by which his borrowing was measured." The former risk, Marshall states, "is inevitable, it must be endured." [12; 190] The latter risk, however, is unnecessary: it can be eliminated via adoption of a stable standard of value.

A second and more important factor contributing to the severity of business cycles in an unindexed economy is the rigidity of money wages, salaries, interest rates, and other business expenses. When the price level is changing, these inflexible money costs are translated into perverse movements in real costs, rising in periods of price deflation and falling in times of price inflation. These perverse movements in real costs contribute greatly to economic instability, encouraging reckless overexpansion in periods of inflation and creating unemployment in periods of deflation. In an inflationary boom, for example, "when prices are rising and the purchasing power of money is falling . . . the employer pays

smaller real salaries and wages than usual, at the very time when his profits are largest." The result of the inflation-induced fall in real wages and the consequent expansionary impact on profits, Marshall claims, is that the entrepreneur "is thus prompted to over-estimate his strength, and engage in ventures which he will not be able to pull through after the tide begins to turn." Similarly, inflation-induced declines in real interest costs, like falling real wages, also contribute to the boom. When nominal interest rates lag behind rising prices, "those working on borrowed capital pay back less real value than they borrowed." Consequently, "people rush to borrow money and buy goods, and thus help prices to rise; business is inflated, it is managed recklessly and wastefully." [12; 190-1] In brief, the failure of inflexible money wages and nominal interest rates to move in step with the price level results in an enlargement of profits during the upswing, thus encouraging reckless speculation and wasteful business expansion.

Similarly, when product prices and nominal sales receipts are falling, sticky money wages and inflexible nominal interest rates eat into profits, thereby inducing employers to cut back output and lay off workers. The following passage, referring specifically to rigid money wages, aptly summarizes Marshall's view of how the downward inflexibility of business costs in general is transformed via falling prices into absolute declines in the level of aggregate economic activity. In such deflationary times, Marshall says:

it would often be well . . . that the employees should take rather less real wages than in times of prosperity. But, in fact, since wages and salaries are reckoned in money which is rising in value, the employer pays higher real wages than usual at such a time unless he can get money wages reduced. This is a difficult task, partly because the employees, not altogether unreasonably, fear that when nominal wages are once let down they will not be easily raised. So they are inclined to stop work rather than accept a nominal reduction even though it would not be a real one. The employer, on his part, finds a stoppage his easiest course He may not happen to remember that every stoppage of work in any one trade diminishes the demand for the work of others; and that, if all trades tried to improve the market by stopping their work together, the only result would be that every one would have less of everything to consume. [12; 191-2]

How could these fluctuations in output and employment be reduced? The obvious solution, said Marshall, is indexation. With nominal wages linked to a price index, "their real value would then no longer fluctuate constantly in the wrong direction, tending upwards just when . . . it should fall, and tending downward just when . . . it should rise." Likewise, the indexation of loans would also con-

tribute to economic stability, because borrowers "would not be at one time impatient to start ill-considered enterprises in order to gain by the expected rise in general prices, and at another afraid of borrowing for legitimate business for fear of being caught by a general fall in prices." [12; 198] In short, by helping to maintain real wages and real interest rates constant between periods of rising and falling prices, indexation would tend to lessen the amplitude and duration of business cycles. Furthermore, by eliminating the risk and uncertainty associated with a fluctuating standard of value—a risk that Marshall calls "a great cause of the discontinuity of industry"—indexation would help insure the maintenance of continual full employment.

Finally, mention should be made of Marshall's views on the question of the appropriate index number to use in index-linked contracts. Generally, Marshall thought that the particular index chosen was a secondary consideration and that any reasonably comprehensive index would suffice for practical purposes. Pointing out that all index numbers have shortcomings, he stated that "we cannot hope to get a standard of purchasing power which is free from great imperfections." In fact, "an absolutely perfect standard of purchasing power is not only unattainable but even unthinkable." Imperfections notwithstanding, *any* index, Marshall felt, would create a more stable standard in real terms than that afforded by money. What matters, Marshall thought, is not so much which index to use—all of them being imperfect—but that the decision be made to use one. Even the crudest and most convenient index, he argued, would provide "a tenfold better standard of value than that afforded by the precious metals." [12; 207, 211]

Irving Fisher Among neo-classical economists, Irving Fisher provided perhaps the clearest and most succinct description of indexation and how it would work. Fisher's discussion of indexing, or the tabular standard of value as he called it, appears in Chapter 13 of his classic *The Purchasing Power of Money* (1911), a chapter devoted, appropriately enough, to "The Problem of Making Purchasing Power More Stable." He discusses the concept also in Chapter 10, which is devoted to a technical analysis of index numbers, their purpose and construction. It is significant that in this latter chapter he notes that "perhaps the most important purpose of index numbers is to serve as a basis of loan contracts." [3; 208]

According to Fisher, the essence of the tabular standard consists of the principle that "contracts could be expressed in terms of an index number."

With the tabular standard in operation, Fisher points out,

The money of the country would continue to be used as a medium of exchange and as a measure of value, but not as a standard for all deferred payments. The standard of deferred payments . . . would be the index number of general prices; and contracts involving deferred payment could, when desired, call for the exchange of a given purchasing power, or of an amount of money varying directly with the index number. [3; 333]

Although the value of money would continue to fluctuate under such an arrangement, "contracts based on index numbers would not be affected because made in terms of the index number."

Indexation, Fisher argued, "would appeal strongly to certain classes," who "would like to be guaranteed a stable purchasing power." Examples might be "a widow, or a trustee, or other long-time investor." Such people "would prefer to buy bonds which guaranteed a regular yearly purchasing power over subsistence, rather than those which merely promised a given sum of money of uncertain value." [3; 333]

Concerning the practical problem of how an economy might move from a non-indexed to an indexed standard of value, Fisher thought that the process might involve two stages. In the first stage, indexation would be adopted solely on a voluntary basis, with individuals deciding at their own discretion whether contracts should be made "in terms of money" or "in terms of the index number." In cases where the latter option was chosen, a purchasing-power clause or "specific proviso," as Fisher termed it, would have to be inserted in the agreement. The only role envisioned for the government in this initial stage would be that of encouraging voluntary adoption of indexation. According to Fisher, two steps could be taken in this direction. First, the government could pass legislation permitting index-linked adjustments. Such legislation, said Fisher, "would not be *necessary*, but it might serve to draw attention to the index method." It would, of course, also remove legal barriers hampering the adoption of indexation. As a second step in facilitating the adoption of indexation, "it might be well for the government to inaugurate an authorized system of index numbers," although this step also would not be absolutely necessary since contracting parties could use, in Fisher's words, "some index number already in vogue, such as Sauerbeck's or the Bureau of Labor's." In short, the government's role in the first stage would be a relatively passive one of *permitting* and *facilitating* the voluntary adoption of indexation. After purchasing-power clauses had gained favor and had ceased to be a novelty, however,

the government might take a more active role, perhaps even making indexation virtually compulsory. In this connection, Fisher writes that if the index-linked "form of contract should become more general . . . legislation could be passed, making the index number the standard in all cases." Generally, Fisher felt that a system of indexation must be fairly comprehensive if it is to be successful. As he put it, "halfway adoption" of indexation "would really aggravate many of the evils it sought to correct." [3: 332-4, 336]

One of Fisher's contributions was his clear and thorough analysis of the objectives and purposes of indexation. He argued, first, that the correction of injustice between debtor and creditor was *not* a legitimate function of indexation, primarily because no such deliberate inequity was wrought by price level changes. His position on the question of distributive justice is perhaps best summarized in the following quotation.

The question of justice between borrower and lender, where the purpose is to fix on the best index number as a standard of deferred payments, was also considered. It was seen to be not an infringement of justice that one man should gain from another on account of fluctuations in the money standard; for the contract is a free one in which normally each should assume whatever risk there may be of loss for the sake of whatever chance there may be of gain. [3; 232]

Similarly, he pointed out that indexation cannot protect real incomes from changes stemming from natural disasters (e.g., drought, crop failures, etc.), depletion and exhaustion of natural resource supplies, and other exogenous non-monetary causes. Nobody, said Fisher, should "expect the monetary unit to insure him against every wind that blows." Elsewhere he states that indexation cannot be a "safeguard . . . against all possible elements of change, but only against those elements which are purely monetary." For example, "a secure monetary standard cannot guarantee against earthquake." In the same vein, he notes that indexation cannot protect against "industrial changes" or the "general effects of invention or progress." Perhaps the point is summarized best in Fisher's statement that "it is no part of the function of an index number of general prices to guard against rising and falling real income." [3: 223-4, 232]

According to Fisher, the main objectives of the tabular standard would be to eliminate or reduce (1) the uncertainty and (2) the harmful distributional and economic effects stemming from unforeseen changes in the price level. In reference to the first objective, Fisher states that the rationale of the index

number "is to measure the change in the level of prices, in order that, in contracts involving deferred payments, there shall be no element of risk so far as money is concerned." In this connection he mentions elsewhere that it is "sound public policy" to reduce "the risk element" thus allowing contracts to be made "on the most certain basis possible." [3; 210, 232]

Concerning the second objective of the tabular standard, Fisher stated that, without indexation, fluctuations in the price level "influence the distribution of wealth among persons and classes," and, even more importantly, "bring about crises and business depressions." "It is desirable," he said, "that some basis for time contracts should be fixed upon which will remedy these evils." Accordingly, he proposed that "an index number expressing the price level . . . be adopted as such a basis." [3; 233]

Like Jevons and Marshall, Fisher argued that indexation would operate to stabilize real economic activity by dampening the amplitude of the business cycle. According to Fisher, business cycles result primarily because of a lag in the adjustment of nominal interest rates to price level changes. The reason for this lag is "imperfect foresight," i.e., actual price changes are neither completely anticipated nor fully incorporated into nominal interest rates. In short, incomplete price expectations create a discrepancy between actual and anticipated price changes. This discrepancy causes nominal and real interest rates to move in opposite directions, generating cyclical disturbances in the process. Thus, when prices are rising, nominal interest rates do not rise sufficiently; and, consequently, real rates fall. Businessmen take advantage of these falling real rates by borrowing from banks in order to finance expansions of production. Moreover, the interest-induced rise in loans is accompanied by a corresponding increase in bank deposits, spurring further rises in the price level. In brief, it is the lagging nominal interest rate and consequent fall in the real rate that stimulates the boom. Similarly, in a downswing, when prices are falling, nominal interest rates again lag behind prices, causing real rates to rise. Businessmen react to rising real rates by reducing borrowing and cutting production. Moreover, the reduction in the volume of bank loans is accompanied by a corresponding contraction in deposits, thus inducing prices to fall even further. The depression phase of the cycle also may be intensified by business bankruptcies and collapses caused by deflation-induced rises in real debt burdens. Essentially, however, lags in the adjustment of nominal interest rates are responsible for the slump.

According to Fisher, indexation would dampen the cycle by speeding the adjustment of nominal interest rates to price changes. With nominal rates moving in step with prices, real rates would remain unaffected by inflation and deflation. And with real rates stable over the cycle, there would be no abnormal encouragement or discouragement of capital investment and the demand for loans. Consequently, the amplitude of fluctuations in real economic activity would be diminished. Moreover, fluctuations in the price-level itself also would be reduced—a result of the index-induced stabilization of the volume of bank loans and hence the corresponding demand deposit component of the money supply. Since, in Fisher's view, variation in the money stock is the primary determinant of price level movements, it follows that the smoothing of cyclical swings in the quantity of deposit money would tend to dampen oscillations in the price level.

This last point, incidentally, was novel and unique to Fisher's analysis. Other neo-classical analysts had argued that indexation would help stabilize real economic activity during price fluctuations. But Fisher was the only one to state explicitly that indexation would also dampen variations in the price level. His position on this point is summarized in the following passage.

The system of making contracts in terms of the price level is not intended directly to prevent fluctuations in price level. Its purpose is rather to prevent these fluctuations from introducing a speculative element into business. But an incidental result of the system would be that fluctuations in the level of prices would be less than before, because credit cycles would no longer be stimulated. The alternate abnormal encouragement and discouragement of loans would cease. Hence, credit fluctuations would become less, and the level of prices would be comparatively unaffected by them. [3; 335]

Fisher's discussion of the stabilization role of indexation calls for one final comment. Throughout his analysis he specifically refers to *unanticipated* fluctuations in the price level. Indexation, he points out, would not be necessary if all price level changes could be accurately anticipated and fully adjusted to. As he put it, "our ideal is not primarily *constancy* of the dollar but rather *dependability*. Fluctuations which can be foreseen and allowed for are not evils." [3; 223] In such cases the nominal rate of interest would adjust fully and instantaneously to compensate for the correctly anticipated price change. Correspondingly, the real interest rate would be free of investment-influencing distortions.

Unfortunately, however, price anticipations are rarely perfect. In Fisher's words, "experience shows that the rate of interest will seldom adjust itself

perfectly to changes in price level, because these changes are only in part foreseen." [3; 210] By linking interest payments to actual price movements, however, indexation in effect eliminates from real yields the investment-distorting discrepancy between actual and anticipated price changes. Or, as Fisher expressed it, indexation provides a system "by which the actual results of the contract should closely approximate the expected results in nearly all cases." [3; 233]

Although he was not as enthusiastic an advocate of indexation as were Jevons and Marshall, Fisher, in 1911, was generally in favor of the device, as indicated by his statement that "on the whole, the tabular standard seems to have real merit." He did, however, devote particular attention to some "serious if not fatal objections" to the scheme. Among the specific disadvantages he discussed were: (1) foreign exchange and international payments problems that indexation might impose on a single country operating in a world of unindexed economies; (2) the costs and inconveniences of converting purchasing power clauses into money terms for payments purposes; (3) bookkeeping complications resulting from the necessity of using a double system of accounts; and (4) difficulties stemming from the incomplete adoption of the scheme, particularly the distortions introduced into profit and loss statements by a double standard of deferred payments. In connection with the first disadvantage, Fisher conceded that a single indexed economy would be forced onto a regime of floating exchange rates, "thus reintroducing the inconveniences of an uncertain rate of international exchange." And regarding the problem of incomplete indexation, Fisher remarked that "halfway adoption" of the scheme would "aggravate many of the evils it sought to correct." Specifically, he pointed out the difficulties that the individual businessman would face if his expenses but not his receipts were indexed.

A business man's profits constitute a narrow margin between receipts and expenses. If receipts and expenses could *both* be reckoned in the tabular standard, his profits would be more stable than if both were reckoned in money. But if he should pay some of his expenses, such as interest and wages, on a tabular basis, while his receipts remained on the gold basis, his profits would fluctuate far more than if both sides, or all items of the accounts, were in gold. In fact, his expected profits would often turn into losses by a slight deviation between the two standards [3; 336]

In spite of these potential difficulties, Fisher attempted to put indexation to practical use in enterprises with which he was associated. Thus he remarks that he "was apparently the first in this

country to introduce the index wage for the purpose of offsetting the rising cost of living in the World War." And in 1925 the Rand Kardex Co., at his recommendation, issued a 30-year purchasing power bond with interest and principal linked to the wholesale price index. These experiments were not successful, however. The index-linked bonds eventually were retired in favor of more marketable gold clause bonds. As for the index-linked wages, Fisher reported that his workers were unable to perceive that the purpose of the scheme was to stabilize *real* wages. Thus, he said, during the wartime inflation, his employees "welcomed the swelling contents of their 'High Cost of Living' pay envelopes. They thought their wages were increasing, though it was carefully explained to them that their real wages were merely standing still. But as soon as the cost of living fell they resented the 'reduction' in wages, and refused to believe that their real wages were not reduced thereby." [4; 387-9] These experiences left Fisher convinced of "the practical omnipresence of the 'money illusion' and of the impracticability of index wages and index bonds as a general solution of the great problem of unstable money." The only feasible general solution to the problem of inflation and deflation, he thought, was proper regulation of the money supply. His own pet stabilization scheme, the celebrated "compensated dollar" proposal, called for regulation of the gold content of the dollar, and thus the quantity of money supportable by a given gold base, by reference to an index number of commodity prices. Using the price index as a guide, the authorities would vary the price of gold and hence the quantity of money in order to maintain stability of the general price level.

ARGUMENTS FOR INDEXED GOVERNMENT BONDS

So far, this article has concentrated on those analysts who favored the application of indexation to a fairly wide range of debts and/or incomes. In addition, there have been many writers who, while not necessarily advocating comprehensive indexation, nevertheless proposed that the principle be applied to specific types of loan contracts. For example, earlier in this century several economists proposed the issue of index-linked government bonds. Thus, John Maynard Keynes, in his 1924 testimony before the Colwyn Committee on National Debt and Taxation, argued that the British Treasury should issue

bonds of which the capital and interest would be paid not in a fixed amount of sterling but in such amount of sterling as has a fixed commodity value as indicated by an index number. [2; 278, 287]

Such bonds, Keynes believed, would have a two-fold advantage: in addition to protecting the holder from the depreciation of the value of money, they would reduce the cost of borrowing to the Treasury. According to Keynes, the Treasury gains by tailoring its issues to the tastes and preferences of different groups of investors, including those with a preference for purchasing-power security over yield. Indexed bonds would appeal to this latter group, which would be willing to sacrifice yield for the purchasing-power guarantee, thus lowering the cost of borrowing to the Treasury. This argument of course assumes that inflation would not occur during the life of the bond; otherwise the index-linked interest cost might rise.

A proposal similar to Keynes's was advanced in 1941 by George L. Bach and Richard A. Musgrave in their note on "A Stable Purchasing Power Bond." In this note, Bach and Musgrave stressed the potential anti-inflationary stabilization effects of indexed government bonds. They suggested, first, that the availability of such securities might increase the incentive to save, thus reducing the amount of consumption spending out of any given level of income. Second, they argued that indexed bonds might induce people to hold their wealth in a relatively non-inflationary form. They pointed out that the anticipation of inflation discourages the holding of wealth in the form of money or fixed-dollar bonds and encourages purchases of real assets, especially consumer durable goods. Thus, during inflationary periods, people will attempt to shift out of money into consumer durables, and the increased spending for the latter assets will accentuate inflation. Contrariwise, if people were provided the alternative of shifting from money assets into a stable purchasing-power bond, a smaller proportion of wealth "would be devoted to 'forward buying' of durables." [1; 823]

Similarly, Bach and Musgrave claimed that an indexed bond would tend to stabilize the cyclical pattern of commodity inventory investment. During booms, a guaranteed purchasing-power security, they asserted, would compete favorably as an investment with the speculative buying and hoarding of commodities. Consequently, bonds would be purchased at the expense of commodity hoarding, thereby lessening inflationary pressure.

Another argument was that purchasing-power bonds would absorb accumulated idle cash balances that otherwise might later contribute to inflationary spending. Bach and Musgrave also contended that such bonds would provide the government with an incentive to control inflation. That is, by imposing upon the government the threat of increased debt

service charges if inflation occurs, indexed bonds "may exert a wholesome pressure on Congress to adopt aggressive anti-inflationary policies." [1; 823] Finally, Bach and Musgrave argued that an indexed bond would provide protection for small savers and other investors seeking security of capital in terms of purchasing power first and yield second.

Virtually this same list of arguments in support of an indexed bond reappeared a decade later (1951) in several economists' replies to a questionnaire prepared by the Joint Committee on the Economic Report. [10] Incidentally, one of the respondents was Milton Friedman, whose reply contains his earliest written statement in support of an index-linked bond. These examples indicate that the concept of index-linked bonds was commonplace long before the current inflationary experience revived interest in them.

COMPARISON OF CONTEMPORARY WITH EARLIER VIEWS

This article has sketched the historical evolution of the concept of indexation from its early 18th century origins, through its subsequent development and elaboration by 19th century classical and neo-classical analysts, and finally to its treatment by earlier 20th century economists. Perhaps the main proposition emerging from this body of writing is the claim that indexation might help to insulate real economic variables from the destabilizing effects of unanticipated changes in the price level. According to the classical and neo-classical writers surveyed in the article, indexation would promote the stabilization of economic activity (1) by reducing the business risks and uncertainties of unforeseen changes in the value of money and (2) by insuring that nominal wage, interest, and other costs adjust swiftly and completely to price-level changes, thus keeping real costs largely unaffected by inflation and deflation over the cycle.

These same propositions appear prominently in contemporary discussions of indexation. Thus, for example, Milton Friedman lays particular emphasis on the stabilizing or insulating properties of indexation when he states that widespread use of escalator clauses "would reduce the adverse side effects that effective measures to end inflation would have on output and employment." Similar to his classical and neo-classical forebears, Friedman argues that indexation would achieve this result in two ways. First, it would eliminate from all contracts and business decision-making the risks of unforeseen changes in the price level. In this connection he writes that

the harmful output and employment effects of changes in the rate of inflation "fundamentally reflect . . . distortions that arise because contracts are entered into under mistaken perceptions about the likely course of inflation. The way to reduce these side effects is to make contracts with prices, wages, or interest rates stipulated in *real* terms, not nominal terms. This can be done through widespread use of escalator clauses." Elsewhere he points out that indexation would reduce the necessity of gambling or speculating on what the rate of inflation will be, because, as he expresses it, "businesses will be able to borrow funds or enter into construction contracts knowing that interest rates and contract prices can be adjusted later on in accord with indexes of prices."

Second, like his classical and neo-classical predecessors, Friedman maintains that indexation would reduce the lag of nominal wages and other money costs behind prices, thus stabilizing real costs and the corresponding real variables that constitute the level of economic activity. In his own words, indexation would insure that "any effects on prices will be promptly transmitted to wage contracts, to contracts for future delivery, and to interest rates on outstanding long-term loans. Accordingly, producers' wage costs and other costs will go up less rapidly than they would without indexation. This tempering of costs, in turn, will encourage employers to keep more people on the payroll, and produce more goods than they would without indexation." [8; 96, 176]

In short, most of Friedman's propositions and arguments concerning indexation as a stabilization device were inherited from earlier writers. Even his proposition that indexation makes it easier for the authorities to bring inflation under control was fully anticipated by G. Poulett Scrope, who contended that the function of the tabular standard was to make feasible closer monetary control over prices.

On still other issues, modern proponents of indexation are in strict accordance with the views of their classical and neo-classical counterparts. Thus when Friedman urges that the federal government index tax-scales and the interest on government securities, as well as the wages and pensions of government workers, he is merely echoing the following proposal made by Alfred Marshall in 1887.

The standard unit of purchasing power being published, the . . . Government itself might gradually feel its way towards assessing rates and taxes . . . in terms of the unit, and also towards reckoning the salaries, pensions, and, when possible, the wages of its employees at so many units instead of so much currency. It should, I think, begin by offering, as soon as the unit was made, to pay for each

£100 of Consols a really uniform interest of three units, instead of a nominally uniform but really fluctuating interest of £3. [12; 199]

It should also be noted that Friedman's argument that indexation of the graduated tax system is necessary to prevent the government from appropriating an increasing fraction of total personal and corporate income was foreshadowed by Scrope's contention in 1833 that indexation was needed to relieve the "great pressure which is now felt from the excessive burden imposed by taxation on the springs of our productive industry." [13; 409] This excessive real tax burden, Scrope explained, resulted from the failure of the government to adjust its nominal tax-bill downwards in proportion to a falling price level.

Friedman also agrees with his classical and neo-classical predecessors on the question of the scope or range of indexation. His version of a comprehensively-indexed economy, one in which, as he puts it, escalator clauses would be applied to "all transactions that have a time dimension," bears a close resemblance both to Joseph Lowe's plan to index all "time contracts" or "contracts of duration" and to Jevons's proposal to index "every money debt of, say, more than three months' standing." And when Friedman asserts that "it is highly desirable that the practice of incorporating escalator clauses be extended to a far wider range of wage agreements, contracts for future delivery of products, and financial transactions involving borrowing and lending," he sounds very much like Marshall who favored indexation of salaries and wages, ground-rents, mortgages, marriage settlements, debentures, common stocks, contracts, wills, and other documents. Finally, it should be noted that Friedman echoes the sentiments of most of his 19th century predecessors when he advocates the voluntary acceptance of escalator clauses in the private sector, with the government's role limited to removing "any legal obstacles" to their adoption.

To summarize, there is very little that is new in contemporary analyses of indexation. Most of the key concepts and arguments already had been fully and repeatedly stated by earlier writers. In fact, it would not be an overstatement to say that virtually all of the major contemporary propositions regarding indexation were inherited without serious modification from classical and neo-classical analysts. It follows, therefore, that current proposals to index incomes, tax-scales, and time contracts should be regarded not as original and novel schemes but rather as the revival and restatement of long-established ideas thoroughly familiar to earlier economists.

Thomas M. Humphrey

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